

**REMARKS**

Claims 1-30 are pending.

Claims 1-4, 6-19, and 21-30 were rejected.

Claims 5 and 20 were indicated to be allowable if rewritten in independent form.

Claims 1, 5, 16, and 30 are independent claims.

Claims 1, 5, 16, and 30 are amended herein.

**Allowable Matter**

The applicants extend appreciation for the indication of allowable subject matter in claims 5 and 20. Claim 5 has been rewritten in independent form, including all limitations of claim 1 and thus, is believed in condition for allowance.

**Rejection Under 35 U.S.C. § 103(a)**

Claims 1-4, 12-19, and 27-29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Irie et al. (US Patent No. 5, 973,435) in view of Ishikawa (European Patent No. 0 762 617). The Office asserts that Irie et al. disclose an alternator comprising two claw pole pieces interlacing, each claw pole having a groove-formed flange portion (40, 42) for accommodating a magnet, and non-magnetic strips interposed between a face of the magnet and the groove. The flanges are alleged to be formed substantially along each side of the poles in the axial direction and formed respective grooves along peripheral sides. The Office also asserts that Ishikawa discloses two claw pole pieces interlacing, each claw pole having respective grooves (9f, Fig. 8A) profiled substantially axially along peripheral sides thereof. The grooves allegedly prevent the magnet from flying away radially from the claw-poles under the influence of centrifugal force during high speed rotation of the rotor. The Office thus alleges obvious an alleged Irie et al. alternator configured with alleged Ishikawa teaching of each claw pole having respective grooves profiled substantially axially along peripheral sides of the poles.

In its 'response to arguments', the Office again asserts that Irie et al. and Ishikawa disclose grooves and groove profile that prevent that prevent the magnet from escaping. The Office also alleges that the argumentative point of view is more akin to flanges forming an undercut groove but is not matched by the claim language.

The applicants respectfully traverse the rejection and submit that claim 1 is patentable over the cited references. Irie et al. and Ishikawa, neither individually nor collectively, teach or suggest the claimed invention. Specifically, Irie et al. and Ishikawa do not teach or suggest interlaced poles including first and second flanges to form an undercut grooves profiled substantially axially along lateral peripheral sides of each pole body, the groove profile preventing an interposed magnet from escaping perpendicularly from the groove in either perpendicular direction. In addition, neither reference provides the motivation to one skilled in the art to combine the references in the manner claimed by the applicants. Further, even if combined, the reference fail to recite the invention claimed by the applicants.

Amended Claim 1 recites an alternator comprising two pole pieces with mutually interlaced poles and a magnet, the poles including a first flange and a second flange, the first flange and the second flange forming an undercut groove therebetween, the groove profiled substantially axially along lateral peripheral sides of each pole body, wherein the grooves engage the magnet between two interlaced poles, the groove profile preventing the magnet from escaping perpendicularly from the groove.

Irie et al. does not clearly discuss the grooves that allegedly formed the flange portions. Previously, the Office acknowledged these 'grooves that form the flange portions' are 'not clearly discussed' in Irie et al. The applicant submit that Irie et al. fails to use of the term 'groove' but refers solely to a shoulder. A shoulder is an angled or sloping part. WEBSTER'S COLLEGIATE DICTIONARY (Mish ed., 9th ed. 1988) and thus refers to that curved portion of the Irie pole between the flange and the side surface of the pole.

Irie et al. teach each side of a pole having a flange that holds magnet holder (32) which holds magnets 34 securely against centrifugal force during operational rotation of the rotor. A flange is a rib or rim for attachment of one object to another. WEBSTER'S COLLEGIATE DICTIONARY (Mish ed., 9th ed. 1988). The applicant respectfully submits that the Irie et al. flange is structurally distinguishable from the undercut groove and groove profile claimed by the applicants. As disclosed, the poles in Irie et al. are not grooved, Irie disclosing not a distinct groove in the surface of a individual claw pole merely a projection on a surface. The Irie flange does not prevent the inward movement of the magnet. Accordingly, the Irie et al. flange fails to render the groove of the applicants' claimed invention obvious as previously acknowledged by the Office. Specifically, a groove is a long narrow furrow or channel; a channel being a a

usually tubular enclosed passage conduit; a long gutter, groove or furrow, a metal bar of flattened U-shaped section. WEBSTER'S COLLEGIATE DICTIONARY (Mish ed., 9th ed. 1988).

In addition, the applicants respectfully submit that the "shoulder" of Ishikawa fails to provide the complementary teaching or suggestion necessary to render the claimed invention obvious. Ishikawa discloses shoulders formed in the opposite side surfaces of claw-shaped pole pieces. The shoulders prevent the permanent magnets from being caused to fly away radially from the magnetic poles by the centrifugal force when the rotor rotates at a high rotating speed. Ishikawa at column 7, line 57 - column 8, line 4 and Figures 8A-8B.

The applicants respectfully submit that the shoulder of Ishikawa is structurally equivalent to the flange of Irie et al., such disclosure acknowledged by the Office as failing to be sufficient to render the applicants' claimed invention obvious. A comparison of Figure 3 of Irie et al. with Figure 8B of Ishikawa reveals an equivalent structure; that is, Ishikawa merely discloses a pole having a flange while utilizing alternative language. The shoulder 9f of Ishikawa Figure 8A is indicated by a dotted line representing that the shoulder is a projection of the pole. In sharp contrast, the applicants' claimed invention recites an inductor including poles having grooves and groove profile that prevents the magnet from escaping perpendicularly from the grooves.

The applicants also note that the shoulder of Ishikawa does not prevent the magnet from escaping perpendicularly inward (i.e., in radially) to the rotor. The shoulder is only on a single end of the pole. While the shoulder may prevent the magnet from passing the shoulder and moving in a radial direction under the influence of a centrifugal force, the shoulder does not and can nor prevent the magnet from moving radially in the opposite direction to that of the shoulder. Contrarily, the claimed invention includes a groove, the groove having a profile that prevents the a magnet from escaping perpendicularly from the groove.

Accordingly, the Applicants submit that claim 1, as both previously presented and as currently presented, is patentable over the cited references. Additionally, claims 2-4, and 6-15, which depend and include all of the limitations of independent claim 1 are also believed patentable based on such dependency as well as further limitation contained therein.

Independent claim 16 alternatively recites an alternator including interlaced poles, the poles having inner flanges and outer flanges which form undercut grooves therebetween, the grooves profiled substantially axially along lateral peripheral sides of each pole body, the magnet

interposed in the grooves between two interlaced poles, the groove profile preventing the magnet from escaping the grooves in a plane perpendicular to the groove profile. Thus, the applicants respectfully reiterate that there is neither the disclosure nor the suggestion Irie et al. or Ishikawa for such grooves along peripheral sides of each pole body. Accordingly, Claim 16 is believed to be patentable over the prior art of record.

As claims 17-29 depend from and include all of the limitations of independent claim 16, these dependent claims are also believed patentable based on such dependency as well as further limitation contained therein.

Independent claim 30 recites the invention in alternative terms. Claim 30 recites, in part, two pole pieces having mutually interlaced poles, the poles having radially inner flanges and radially outer flanges with respect to the axial axis of the pole, wherein the outer flanges and corresponding inner flanges form undercut grooves profiled substantially axially along lateral peripheral sides of each pole body, the magnet interposed in the undercut grooves between two interlaced poles, the groove profile preventing the magnet from escaping perpendicularly from the undercut grooves. Corresponding flanges form the grooves. For this reason, the Applicant reiterates the remarks above and respectfully submits that claim 30 is allowable over the cited references.

Claims 6-8 and 21-23 were rejected under 35 U.S.C. § 103(b) as being unpatentable over Irie et al. in view of Ishikawa and in view of the ordinary skill of a worker in the art. The Office asserts that the added limitations of the groove having a U-shaped profile or V-shaped profile would be an obvious engineering design choice. Claims 9, 24 and 30 were rejected under 35 U.S.C. § 103(b) as being unpatentable over Irie et al. in view of Ishikawa and in view of Yamada et al. (US 5,734,216). The Office asserts that Yamada et al. teach a layer of adhesive between the strip and the magnet. Claims 10-11 and 25-26 were rejected under 35 U.S.C. § 103(b) as being unpatentable over Irie et al. in view of Ishikawa and in view of Yamada and view of Mitcham et al. (US 5,877,578), which is alleged to teach a permanent magnet comprising a plurality of separate magnet parts that are bonded together. The Office asserts such a combination to be obvious to one having skill in the art.

With respect to these rejections, each rejected claim depends from and includes all the limitations of base claim 1 or 16 respectively. Claims 1 and 16 are believed to be allowable over the prior art as explained above. Accordingly, these dependent claims are believed patentable

based on claim dependency in addition to additional patentable subject matter contained in these subject claims.

**Reference Citation Requested**

The Office utilizes Irie et al. (US 5,973,435) in the rejection of claims. The applicants note that Irie et al. is not listed in any PTO-892 Notice of References Cited nor was the reference submitted by the Applicants in an Information Disclosure Statement or PTO 1449. The applicants also note that Irie et al. qualifies as prior art under 35 U.S.C. § 102(e).

The present application claims priority to French patent application FR 98 12359 filed October 2, 1998. Section 102(e) prior art may be removed as a reference, if the reference is not a U.S. patent claiming the same invention, by submission of a declaration under 37 C.F.R. § 1.131 attesting to the conception and actual reduction to practice of the invention claimed prior to the effective date of the reference. Accordingly, Irie et al. may be removed as a reference by submission of a declaration under 37 C.F.R. § 1.131 attesting to the conception and actual reduction to practice of the invention claimed herein prior to the effective date of Irie et al., May 6, 1998. Nevertheless, the applicants do not submit such a 131 declaration at this time, preferring instead to patentably distinguish the claimed invention from the cited reference.


**Conclusion**

Based on the foregoing remarks, it is respectfully submitted that all of the claims as currently pending are patentable and in condition for allowance. Reconsideration of the application and withdrawal of the rejections are respectfully requested.

In the event that a telephone conference would facilitate examination in any way, the Examiner is invited to contact the undersigned representative at the number provided.

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**CLAIMS MARKED TO SHOW CHANGES MADE**

1. (Five Times Amended) An alternator for a vehicle, comprising  
two pole pieces having mutually interlaced poles, and  
a magnet, the poles including [grooves] a first flange and a second flange, the first flange and the second flange forming an undercut groove therebetween, the groove profiled  
substantially axially along lateral peripheral sides of each pole body, wherein the grooves engage the magnet between two interlaced poles, the groove profile preventing the magnet from escaping perpendicularly from the [grooves] groove, and  
a strip interposed between a face of the magnet and a first portion of at least one of the grooves, the strip being produced from a nonmagnetic material which is less hard than the magnet.
2. The alternator as claimed in claim 1, wherein the strip is interposed between the magnet and the first portion of each of the grooves.
3. The alternator as claimed in claim 1 wherein the strip covers a circumferential face of the magnet.
4. The alternator as claimed in claim 3, wherein the circumferential face is oriented in a direction opposite to a shaft of the alternator.
5. (Three Times Amended) [The alternator as claimed in claim 1, further comprising]  
An alternator for a vehicle, comprising  
two pole pieces having mutually interlaced poles, and  
a magnet, the poles including grooves profiled substantially axially along lateral  
peripheral sides of each pole body, wherein the grooves engage the magnet between two  
interlaced poles, the groove profile preventing the magnet from escaping perpendicularly from  
the grooves.

a strip interposed between a face of the magnet and a first portion of at least one of the grooves, the strip being produced from a nonmagnetic material which is less hard than the magnet, and

a second strip produced from a nonmagnetic material which is less hard than the magnet, the strips interposed between respective opposed faces of the magnet and the first portion and a second portion respectively of at least one of the grooves.

6. The alternator as claimed in claim 1, wherein the groove profile of at least one groove is "U"-shaped.
7. The alternator as claimed in claim 1, wherein the groove profile of at least one groove is "V"-shaped, the "V"-shaped groove profile having a first branch which is locally parallel to a circumferential face of the poles.
8. The alternator as claimed in claim 7, wherein the "V"-shaped groove profile has two branches, the first branch closer to a shaft of the alternator than the other branch.
9. The alternator as claimed in claim 1, further comprising a layer of adhesive which is more flexible than the magnet and is interposed between the strip and the magnet.
10. The alternator as claimed in claim 9, wherein the magnet includes two separate parts bonded to one another by a layer of material which is more flexible than the magnet.
11. The alternator as claimed in claim 10, wherein the material is identical to the adhesive.
12. The alternator as claimed in claim 1 having a plurality of magnets and a plurality of strips, wherein at least two of the plurality of magnets are associated with respective strips.
13. The alternator as claimed in claim 12, wherein a majority of the magnets are associated with respective strips.



14. The alternator as claimed in claim 12, wherein the strips comprise parts that are independent of one another.
15. The alternator as claimed in claim 1, wherein the strip comprises glass fiber embedded in pre-impregnated plastic.
16. (Four Times Amended) An alternator for a vehicle, the alternator comprising:  
a magnet;  
two pole pieces having mutually interlaced poles, the poles having inner flanges and outer flanges which form undercut grooves therebetween, the grooves profiled substantially axially along lateral peripheral sides of each pole body, the magnet interposed in the grooves between two interlaced poles, the groove profile preventing the magnet from escaping the grooves in a plane perpendicular to the groove profile; and  
a first strip of nonmagnetic material less hard than the magnet, the first strip interposed between the magnet and a first portion of at least one of the grooves.
17. The alternator of claim 16 wherein the first strip is interposed between the magnet and the first portion of each of the grooves.
18. The alternator of claim 16 wherein the first strip covers a circumferential face of the magnet.
19. The alternator of claim 18 wherein the circumferential face is oriented in a direction opposite to a shaft of the alternator.
20. The alternator of claim 16 further comprising a second strip of nonmagnetic material, the first strip and the second strip interposed between respective opposed faces of the magnet and the first portion and a second portion respectively of at least one of the grooves.
21. The alternator of claim 16 wherein at least one groove is "U"-shaped.



22. The alternator of claim 16 wherein at least one groove is "V"-shaped, with a first branch of each "V"-shaped groove locally parallel to a circumferential face of the poles.
23. The alternator of claim 22 wherein the first branch is closer to a shaft of the alternator than the other branch of the "V"-shaped groove.
24. The alternator of claim 16 further comprising a layer of adhesive more flexible than the magnet, the layer of adhesive interposed between the first strip and the magnet.
25. The alternator of claim 24 wherein the magnet includes two separate magnet portions bonded to one another by a layer of material more flexible than each of the magnet portions.
26. The alternator of claim 25 wherein the material of the layer is identical to the adhesive.
27. The alternator of claim 16 comprising a plurality of magnets and a plurality of strips, wherein at least two of the plurality of magnets are associated with respective strips.
28. The alternator of claim 27 wherein the respective strips comprise parts that are independent of each other.
29. The alternator of claim 16 wherein the first strip comprises glass fiber embedded in pre-impregnated plastic.
30. An alternator for a vehicle, the alternator comprising:  
a magnet;  
two pole pieces having mutually interlaced poles, the poles having radially inner flanges and radially outer flanges with respect to the axial axis of the pole, wherein the outer flanges and corresponding inner flanges form undercut grooves profiled substantially axially along lateral peripheral sides of each pole body, the magnet interposed in the undercut grooves between two interlaced poles, the groove profile preventing the magnet from escaping perpendicularly from the undercut grooves;

a strip of nonmagnetic material less hard than the magnet, the strip interposed between the magnet and a portion of at least one of the grooves, the strip covering a circumferential face of the magnet oriented in a direction opposite to a shaft of the alternator; and

a layer of adhesive more flexible than the magnet, the layer of adhesive interposed between the strip and the magnet.